

M E R R T T

Shipments by DOE



PREFACE

The U.S. Department of Energy (DOE) Transportation Emergency Preparedness Program (TEPP) integrates transportation emergency preparedness activities under a single program to address the emergency response concerns of state, tribal, and local officials affected by the shipment of radioactive material. TEPP's goals are to:

- Ensure that DOE meets its transportation emergency responsibilities under federal regulations
- Address state, tribal, and local government concerns about emergency preparedness for DOE radioactive material shipments
- Coordinate DOE-wide transportation emergency preparedness activities for nonweapons-related radioactive material shipments
- Support emergency responders at all levels of government

The Modular Emergency Response Radiological Transportation Training (MERRTT) has been developed to provide real-world training for real-world issues. MERRTT satisfies the training requirements outlined in the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act [refer to Public Law 102-579¹ Section 16, Transportation (Accident Prevention and Emergency Preparedness) and (Transportation Safety Programs)].

MERRTT has a modular design, consisting of several concise and easy to understand modules that can be integrated into existing programs for hazardous material training. MERRTT was designed to provide facilitated (instructor-led) or self-paced instruction. For instructor-led training, instructional guides are available for each module. While the course may be taken through self-paced instruction, **the student must attend an instructor-led session and score 70% or higher on the course examination to satisfy WIPP's training requirements.**

¹ 102 Congress, October 30, 1992, amended by 104 Congress.

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M E R R T T **Shipments by DOE**

notes

MERRTT is intended for responders who have had hazardous material response training. The responders' needs during an emergency were carefully considered during the development of MERRTT.

ACKNOWLEDGEMENTS

Through the Transportation Emergency Preparedness Program (TEPP), the U.S. Department of Energy, in coordination with federal, state, tribal, and local agencies, developed MERRTT to provide response agencies; fire, law enforcement, emergency medical services, public works, and hospital personnel, with information designed to meet the challenge of preparing for a response to an incident involving radioactive material. Members of the Transportation External Coordination Working Group, Western Governors' Association, and the Waste Isolation Pilot Plant participated in the development of this training material.

DISCLAIMER

This course is not designed to meet the complete training requirements of 29 CFR 1910.120(q)(6) for "First Responder Awareness Level," "First Responder Operations Level," "Hazardous Material Technician," "Hazardous Material Specialist," nor "On-Scene Incident Commander." These levels of competency require more hours of training or additional specific areas of competency than will be presented in this course. The procedures and training in this program are guidance for the development of standard operating procedures specific to your agency. This course is one of many available resources designed to enhance your existing emergency response program's radiological material response capabilities.

M E R R T T Shipments by DOE



INTRODUCTION

Although the Department of Energy (DOE) is but a minor shipper as it relates to the total number of radioactive material shipments being transported in the United States, it is the major shipper of radioactivity associated with these shipments.

In this module you will learn about the material being transported by the DOE. You will learn about the modes used to transport material by DOE, and the safety measures in place to ensure that this material is moved safely throughout the United States.

PURPOSE

The purpose of this module is to increase your knowledge of the DOE's transportation program. Having an understanding of the material being transported by DOE and how it is transported will increase your ability to quickly recognize, safely respond, and accurately relay information during an accident involving DOE owned radioactive material.

MODULE OBJECTIVES

Upon completion of this module, you will be able to:

1. Identify the types of radioactive material being transported to and from various DOE sites.
2. Identify the transportation modes used by DOE to transport radioactive material.
3. Identify the enhanced safety measures used by DOE.

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M E R T T Shipments by DOE

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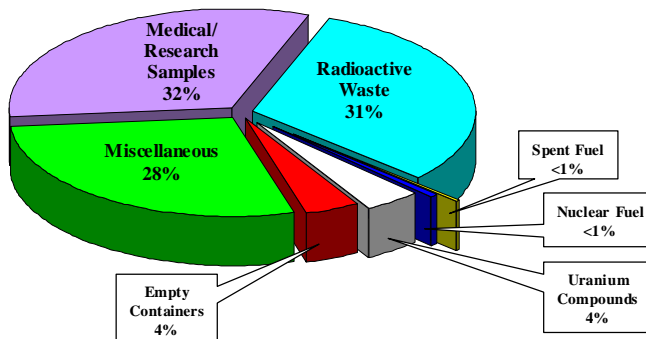
OVERVIEW OF DOE

Over its two-decade history, the Department of Energy (DOE) has shifted its emphasis and focus as the needs of the nation have changed. During the late 1970's, the Department emphasized energy development and regulation. In the 1980's, nuclear weapons research, development, and production took a priority. Since the end of the Cold War, the Department has focused on environmental clean up of the nuclear weapons complex, nonproliferation and stewardship of the nuclear stockpile. As a result, the transportation of radioactive and other hazardous material has become an important part of many DOE programs.

Overview of DOE'S Shipping Activity²

The U.S. Department of Transportation (DOT) estimates that approximately 500 billion packages of all commodities are transported each year in the U.S. About 100 million of these packages are hazardous material. Of these, approximately 2.8 million contain radioactive material. DOE ships approximately 5,000 radioactive material shipments annually. The number of DOE radioactive material shipments will continue to increase with the ongoing cleanup of its sites.

Of the DOE shipments, medical and research isotopes are the most frequently shipped radioactive material (32 percent). Radioactive waste resulting from DOE operations and environmental cleanup activities are the second most commonly shipped radioactive material (31 percent) and are expected to increase substantially over the next few years. Uranium compounds are shipped by DOE as part of site cleanup and nuclear material stewardship. Used or "spent" fuel accounts for less than 1 percent of DOE radioactive material shipments. The chart below summarizes DOE's shipping activity.



² Information presented is based on data from DOE transportation activities for Fiscal Year 1998 and should be considered representative of DOE's total shipping activity.

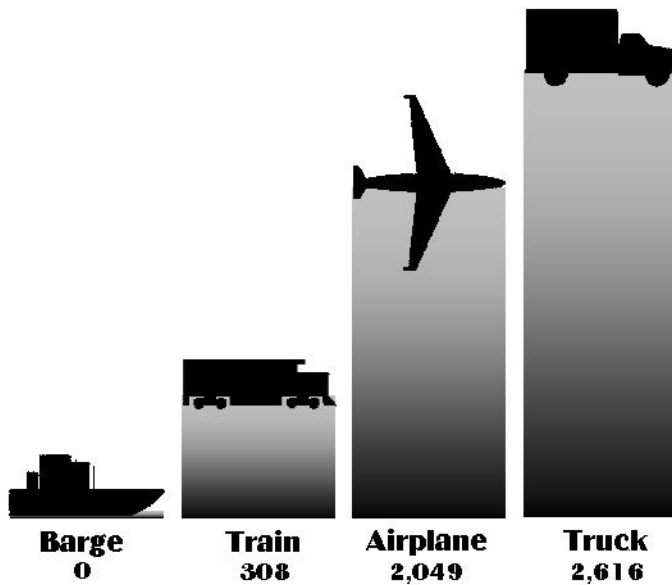
M E R R T T

Shipments by DOE



COMMON MODES OF TRANSPORT

DOE uses all modes of transport for shipment of radioactive material; commercial trucks, airplanes and rail are the most commonly used modes. The majority of DOE's radioactive material shipments are made by truck. Typically, DOE contracts with commercial carriers to transport their radioactive material. Shipments made by air consist primarily of medical and research isotopes. These materials are very lightweight and must be delivered quickly because of their short half-lives. A small percentage of DOE's radioactive material shipments travel by rail. Due to the heavy weight of the shipping casks, spent fuel is often transported by rail to storage facilities.



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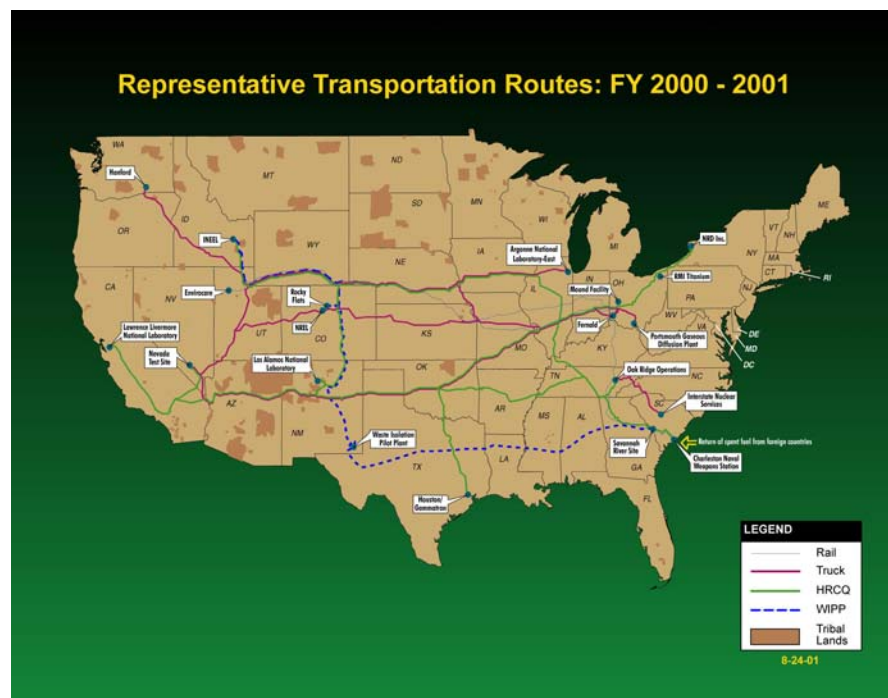


M E R T T Shipments by DOE

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TRANSPORTATION ROUTES

The map below is a representative map of major transportation routes used throughout the United States. The map shows the major DOE sites and the major routes used for shipments of DOE owned radioactive material.



Enhanced Safety Measures

Because of the highly proactive safety philosophy of the regulators and transporters of radioactive material, there has never been a death or injury resulting from exposure to radioactive material during transport. DOE is subject to, and complies with, all applicable federal, tribal, state, and local regulations created for the protection of workers, the public, and the environment.



M E R R T T

Shipments by DOE



Some examples of DOE-implemented enhanced safety measures are listed below.

TRANSCOM

DOE monitors some of its shipments using the Transportation Tracking and Communications system (TRANSCOM). The TRANSCOM transponder transmits a signal, allowing the shipment to be tracked via satellite.

The TRANSCOM system combines satellite communications, computerized database management, user networks, and ground communications to follow the progress of some en route shipments of hazardous materials (e.g., spent nuclear fuel, high-level radioactive waste, and other specific shipping campaigns as needed).

How TRANSCOM Works

TRANSCOM uses communications equipment and a satellite positioning/reporting system to track truck, rail, ship, and barge shipments. Transponders mounted on transport vehicles send signals to a satellite and the signal is then sent to a receiving station that identifies vehicle location. Vehicle location and messages are relayed to the TRANSCOM Control Center (TCC) through a telecommunications link at near real time. The TRANSCOM central computer uses this to display the shipment information on a series of computer-generated maps. Authorized users include DOE, the U.S. Nuclear Regulatory Commission (NRC), U.S. Department of Transportation (DOT), and tribal, state, and local governments.

Available Shipping Information

Authorized users can access the TRANSCOM system to obtain information concerning current and upcoming shipments. This includes specific information such as schedules, planned routes, and the types of materials being transported, as well as emergency response information specific to each shipment being tracked.

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M E R T T Shipments by DOE

notes

Carrier/Driver Requirements

Carriers must possess a DOT safety rating of satisfactory, must have been approved for DOE by the Motor Carrier Evaluation Program (MCEP), and have a contract or tender currently on file. Drivers must present evidence of radioactive materials transportation training and must possess a valid Commercial Drivers License. DOE reserves the right to reject carrier equipment that is, or appears to be, in disrepair. Carriers must show evidence of sufficient insurance coverage along with proof of hazardous materials transport registration with the U.S. DOT. Carriers also serving as shipment escorts or couriers must provide evidence of qualification and training, and must follow written instructions.

Vehicle Inspections

In 1986, the U.S. Department of Energy's (DOE), Office of Civilian Radioactive Waste Management (OCRWM) requested that the Commercial Vehicle Safety Alliance (CVSA), under a cooperative agreement develop an inspection standard for their future shipments of spent nuclear fuel and other high-level radioactive material shipments. The goal was to develop a standard which will ensure the protection and safety of people and

the environment by setting and enforcing ridged inspection standards and safeguards for the transportation of radioactive material. The Enhanced CVSA inspection protocol supports a single, point-of-departure, pre-shipment, detailed inspection of high-visibility shipments conducted by a certified inspector. If the shipment meets the standards, the inspector will attach a one-trip CVSA decal to inform others of the pre-shipment vehicle and shipment condition. This pre-shipment inspection is intended to supersede individual state inspections that could unnecessarily prolong shipping times and increase the radiation exposure to inspectors. In order to pass the Enhanced CVSA inspection, the vehicle, drivers, and cargo must be "defect free" as defined by the inspection standard before they may leave their point of origin. If the vehicle, drivers, and cargo do not pass the inspection, the vehicle is placed out-of-service.



M E R R T T

Shipments by DOE



TRANSPORTATION PROTOCOLS

Transportation Routing

DOE hazardous material shipments will generally follow the U.S. DOT hazardous and/or radioactive materials routing requirements, using preferred road routes or preferred alternatives. All surface routes are chosen based on the intent of the road routing regulations, which is to minimize the time in transit for hazardous shipments. Written route plans for spent fuel shipments will be approved by the NRC. Written route plans for other highway-route-controlled-quantity (HRCQ) shipments will be made by the carrier and transmitted to the DOT.

Safe Parking

Shipments are generally planned as “through” shipments with minimal planned stops for inspections, food, and fuel as necessary. Highway shipments will generally require two drivers to allow for continuous movement. Rail shipments may require additional interaction with the railroads to ensure expedited forwarding of shipments and interchanges between railroad companies (if applicable). Shipments that must be stopped because of local conditions, weather events, or other reasons should be held at locations that would otherwise meet the Safe-Haven requirements for explosive shipments. Well-lighted locations with restricted public access and no restrictions on radio or telephone communications are preferred safe parking locations.



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M E R T T Shipments by DOE

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PUBLIC INVOLVEMENT

The DOE seeks public involvement at a variety of levels in an effort to ensure that stakeholders are involved in issues affecting the safe transport of DOE owned radioactive material. A few of the organizations and programs involved in this process are listed below.

National Governors Association/Department of Energy Task Force

The National Governors Association/Department of Energy (NGA/DOE) Task Force, which is supported by the Department of Energy, consists of Department officials and representatives from Governors' offices from states which host DOE facilities. The purpose of the task force is to assist the Department of Energy in improving coordination of its major program decisions with Governors' offices and state regulators and to ensure such decisions reflect input from these key state officials and stakeholders.

Transportation Emergency Preparedness Program

The Transportation Emergency Preparedness Program (TEPP) is a Department-wide program which integrates transportation emergency preparedness activities under a single program to address the emergency response concerns of state, tribal, and local officials affected by the Department of Energy's (DOE) shipment of radioactive materials. As a part of the Transportation Emergency Preparedness Program, TEPP "tools" have been developed to assist responders along the shipping corridors for DOE shipments of radioactive material. This enables responders to be prepared in the event of a transportation incident. These tools provide a standardized approach to transportation emergency preparedness planning for radioactive material shipments.

Transportation External Coordination Working Group

Through the Transportation External Coordination Working Group (TEC/WG), DOE interacts with representatives of organizations at the state, tribal, and local levels to obtain input for program needs assessment, development and management, and to enhance their capability to carry out transportation emergency preparedness and safety activities specifically related to radioactive materials shipments.

Check Your Understanding



1. Which of the following categories of radioactive material does the DOE most frequently transport?
 - a. Radioactive waste resulting from DOE operations
 - b. Uranium compounds
 - c. Medical and research isotopes
 - d. Spent nuclear fuel
2. The majority of DOE's radioactive material shipments are made by which of the following transportation modes?
 - a. Air
 - b. Rail
 - c. Truck
 - d. Barge
3. DOE uses all modes of transport for shipment of radioactive material. True/False.
4. As an enhanced safety measure, DOE monitors some of its shipments using the _____ system.
5. During a CVSA enhanced inspection, if the vehicle, drivers, and cargo do not pass the inspection, the vehicle is:
 - a. Not allowed to travel faster than 35 m.p.h.
 - b. Given a fine
 - c. Placed out-of-service
 - d. Returned to its point of origin

M E R T T



ANSWERS

1. c
2. c
3. True
4. TRANSCOM
5. c